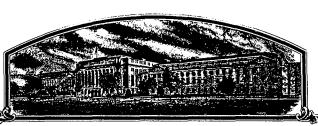
No.



9000126

THE UNITED STATES OF ANTERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Golden's Foundation Seeds, Inc.

Conhereus. There has been presented to the

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT LIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT AT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH202'

In Eastimony Watercot, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 28th day of June in the year of our Lord one thousand nine hundred and ninety-one.

al A a la

Commissioner

Plant Variety Protection Office Agricultural Marketing Service

A X A A X A A X I S I

Gerotary of Agriculture

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Office, OIRM, Room 404-W, Washington, D.C. 2050; and to the Office of Management and Budget, Paperwork Reduction Project (OMB #0581-0055), Washington, 20250.

U.S. DEPARTMENT OF AGRICULTUR AGRICULTURAL MARKETING SERVIO	Application is required in order to			
APPLICATION FOR PLANT VARIETY PRO	determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).			
NAME OF APPLICANT(S) (as it is to appear on the Certificate)	2. TEMPORARY DESIGNATION EXPERIMENTAL NO.	N OR 3. VARIETY NAME		
Holden's Foundation Seeds, Inc.	Ex1176	LH202		
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP)	5. PHONE (Include area code	FOR OFFICIAL USE ONLY		
P.O. Box 839		PVPO NUMBER		
201 North Maplewood Avenue		9000126		
Williamsburg, Iowa 52361	319-668-1100) •		
		Date Than, 23, 1990		
6. GENUS AND SPECIES NAME 7. FAMILY	NAME (Botanical)	Time		
Zea mays	Gramineae	G A.M. P.M.		
8. CROP KIND NAME (Common Name)	9. DATE OF DETERMINATION	F Filing and Examination Fee:		
Corn, Field	November 1987			
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (C	orporation, partnership, association, etc.)	B Mar. 23, 1996		
Corporation		C Certificate Fee: MO		
11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION	- [: 250.		
Iowa	1968	E Date 17, 1991		
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN T	HIS APPLICATION AND RECEIVE ALL PAPERS			
Mr. Mark Armstrong				
P.O. Box 839				
Williamsburg, IA 52361	PHONE (Include	319-668-1100		
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUC				
a. Exhibit A, Origin and Breeding History of the Variety.				
b. 🔀 Exhibit B, Novelty Statement.	· ·			
c. X Exhibit C, Objective Description of Variety.		14		
d. 🔀 Exhibit D, Additional Description of Variety. e. 💢 Exhibit E, Statement of the Basis of Applicant's Ownership.	•			
Seed Sample (2,500 viable untreated seeds). Date Seed Sample m.	ailed to Plant Variety Protection Office	121190		
g. X Filing and Examination Fee (\$2,150) made payable to "Treasurer of				
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARI Protection Act.) YES (II "YES." answer items 16 and 17 below)	ETY NAME ONLY AS A CLASS OF CERTIFIED S X NO (If "NO," skip to item 18 below)	EED? (See section 83(a) of the Plant Variety		
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO	17. IF "YES" TO ITEM 16, WHICH CLASSES OF	PRODUCTION BEYOND BREEDER SEED?		
NUMBER OF GENERATIONS?				
YES NO	[FOUNDATION [REGISTERED CERTIFIED		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE	IE U.S.?			
YES (If "YES," through Plant Variety Protection Act Pater	nt Act. Give date:)			
X NO				
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED I	N THE U.S. OR OTHER COUNTRIES?			
YES (If "YES," give names of countries and dates)				
NO X				
20. The applicant(s) declare(s) that a viable sample of basic seeds of thi	ith will be Considered with the on	plication and will be replanished upon		
request in accordance with such regulations as may be applicable.	s variety will be fulfitshed with the ap	phication and will be replemaned upon		
The undersigned applicant(s) is (are) the owner(s) of this sexually uniform, and stable as required in section 41, and is entitled to prote	reproduced novel plant variety, and ction under the provisions of section 42	believe(s) that the variety is distinct, of the Plant Variety Protection Act.		
Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.				
SIGNATURE OF APPLICANT (Owner(s))	CAPACITY OR TITLE	DATE		
11 . 1.11 - 1/2/2//	Drogilont	3/2//90		
Though the	President	DATE		
SIGNATURE OF APPLICANT [Owner(s)]	CAPACIT UN IIILE	Junio Caracteristics and the caracteristics a		
		·		

FORM CSSD-470 (5-89) Edition of FORM LS-470, 3-86, is obsolete.



Origin and Breeding History of the Inbred

Exhibit A

LH202 was developed from the single cross A662 x B73. This cross was selfed once and then backcrossed twice with B73. After the backcrossing was complete, the combination A662 x B73S1)(B73⁻² was then selfed for six generations and the pedigree system of plant breeding was used. Please note the original cross A662 x B73 was obtained from the University of Minnesota. A662 (formerly A68-5) was developed and released to the public by the University of Minnesota. B73 was developed and released to the public by Iowa State University. On the following page is a schematic description of the development of LH202. Also included are copies of pages from Holden's Foundation Seed, Inc. nursery books. The rows associated with the development of LH202 have been highlighted.

Attached is a statement from the originating plant breeder, Richard Miller, stating that the line is stable, uniform and free of variance from within the population.

Origin and Breeding History of the Inbred $LH202 = Ex1176 = A662 \times B73 \text{ S1})(B73)$

Row/Field	Pedigree	Location	Year
Jones Field	LH202	Iowa	1989
Jones Field	LH202	Iowa	1988
Adolpho	LH202	Hawaii	1987-88
6434-6443	Ex1176	Iowa	1985
15412	A662 x B73 S1)(B73) ² @6	Iowa	1984
4164	A662 x B73 S1)(B73) @5	Minnesota	1983
15382	A662 x B73 S1)(B73) ^a -@4	Hawaii	1982-83
20974	A662 x B73 S1)(B73) (@3	Iowa	1982
11300	A662 x B73 S1)(B73) @2	Hawaii	1981-82
1456	A662 x B73 S1)(B73) @1	Iowa	1981
1380	A662 x B73 S1)(B73)	Hawaii	1980-81
2222	A662 x B73 S1)(B73	Iowa	1980
9052-9070	A662 x B73 @1	Iowa	1978
9071	B73	Iowa	1978
5355-5357	A662 x B73	Hawaii	1977-78
616	B73	University of Minnesota	1974
749	*A68-5	University of Minnesota	1974

^{*}A68-5 is the former designation of A662

Uniformity Statement

I have observed LH202 during the last four generations it has been increased, 1985 Iowa nursery rows 6434-6443, 1987-88 Hawaii production Adolpho Field, 1988 Iowa production Jones Field and 1989 Iowa production Jones Field. In each of these increases, seeds from the previous generation were planted. The corn inbred line LH202 is uniform, stable and free of variance from within the population.

Richard J. Miller

Ruhal & Milly

Plant Breeder

Novelty Statement

Exhibit B

LH202 most closely resembles LH149, however the most distinguishing characteristic is the glume. LH202 has a solid green colored glume while the glume of LH149 is green with a distinctive red ring at the base of the glume. This difference can be seen in the photograph below.

The glume color of LH202 is green with a purple stripe under lush, favorable growing conditions. However, under heat or drought stress, the purple markings on the glume are absent. A red ring is sms 5/29/9, not found at the base of the LH202 glume.

from applications of the LH202 glume.

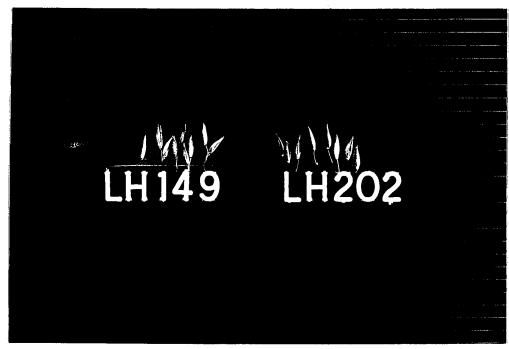


Exhibit B (continued)

Glume Coloring of LH202 and LH149





FORM GR-470-28 (2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE GRAIN DIVISION

EXHIBIT C (Corn)

HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY

CURN (ZEA MATS)	
NAME OF APPLICANT(S)	FOR OFFICIAL USE ONLY
Holden's Foundation Seeds, Inc. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	PVPO NUMBER 9 0 0 0 1 2 6
201 N. Maplewood Avenue	VARIETY NAME OR TEMPORARY
P.O. Box 389	DESIGNATION
Williamsburg, Iowa 52361	LH202
Place the appropriate number that describes the varietal character of this variety Place a zero in first box (e.g. 0 8 9 or 0 9) when number is either 99 or	y in the boxes below.
	less or y or less.
1. TYPE: 2	5 = POP 6 = ORNA. ENTAL
2. REGION WHERE BEST ADAPTED IN THE U.S.A.:	
1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEA 5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REC	
3. MATURITY (In Region of Best Adaptability): (U	Inder "comments" (pg. 3) state how
7 6 DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK	eat units were calculated) 1 3 1 4 HEAT UNITS
DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY	HEAT UNITS
0 0 DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE	0 0 0 0 HEAT UNITS
4. PLANT:	
2 2 7 CM. HEIGHT (To tassel tip)	0 9 8 CM, EAR HEIGHT (To base of top ear)
1 6 CM. LENGTH OF TOP EAR INTERNODE	
Number of Tillers: Number of Ears P	er Stalk:
1 = NONE $2 = 1-2$ $3 = 2-3$ $4 = >3$ 1 = SINGL 3 = STRON	E 2 = SLIGHT TWO-EAR TENDENCY NG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY
Cytoplasm Type:	
1 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = 6	OTHER (Specify)
	3474.4079.704.414.414.414.414.414.414.414.414.414.4
5. LEAF (Field Corn Inbred Examples Given):	
Color: 5GY 4/4 Munsell Color Charts for Plant Ti	ssues
1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DA	RK GREEN (B14) 4 = VERY DARK GREEN (K166
Angle from Stalk (Upper half): Sheath Pubscence	K
11 1 2 30 2 30 31	LIGHT (W22) 2 = MEDIUM (WF9) HEAVY (OH26)
Marginal Waves: Longitudinal Crea	ases:
3=	ABSENT (OH51) 2 = FEW (OH56A) MANY (PA11)
Width: Length:	
1 0 CM. WIDEST POINT OF EAR NODE LEAF 0 7 9	CM. EAR NODE L EAF
1 2 NUMBER OF LEAVES PER MATURE PLANT	en al marchine de la companya de la

ю.	I ASSEL:							
	0 8	NUMBER OF	LATERAL BRAN	CHES				
	Branch And	le from Central S	Snike:	•	Dondunala Lan	ueb.		
	2	1 = < 309	2 = 30-40°	3 = > 45°	Penduncle Leng		OP LEAF TO BASAL B	RANCHES
	Pollen Shed					(10.10.1		
		1 = LIGHT (W	F9)	2 = MEDIUM	3 = HEA	VY(KY21)		
	6	Anther Color: Glume Color:	1 = YELLON	N 2 = PIN (Specify) Steen W	ik 3=F vith purple	stripe	PURPLE 5 =	GREEN
	Pollen Rest	oration for Cytor	plasms (o = Not Te	ested, 1 = Partial, 2 = 0	Good)			•
	0 "т"	0	"s" 0			Cytoplasm and degr	ees of restoration)	
	7 FAD (11			241 1				
•	/. EAR (Husi	ked Ear Data Exc	cept When Stated (Otherwise):			· · · · · · · · · · · · · · · · · · ·	
	1 5	CM LENGTH	5 0 MI	M. MID-POINT AMETER	1 2 9	GM, WEIGH	т	•
	Kernel Row	s:						
	2			DIOTINGT	1 8	NUMBER		
		1 = INDISTING	CT 2:	= DISTINCT		لــــُـــ		*
		· ·				*		
	1	1 = STRAIGHT		LIGHTLY CURVED	3 = SPI	RA L		
	Silk Color (Exposed at Silkin	ng Stage):			•		
	1	1 = GREEN	2 = PINK	3 = SALM0	ON 4	= RED		
	Husk Color:							
	1	FRESH	1 = LIGH	IT GREEN	2 = DARK (GREEN	3 = PINK	
	6	DRY	4 = RED	5 = f	PURPLE	6 = BUFF		
		ion: (Harvest St	age)		Husk Leaf: "R	abbit Ears"	are present o	n the husk
	1 = SH 2 3 = L0	HORT (Ears Expo DNG (8–10CM B	osed) 2 = MEDIU Beyond Ear Tip)	M (Barely Covering Ea		1 = SHORT (< 1 3 = LONG (> 1	3 CM) 2 = MEDIUM (
	Shank:	ERY LONG (>	IO CM)		Position at Dry	Husk Stage:		
	1 5	CM LONG	8 NO. OF I	NTERNODES	1	1 = UPRIGHT	2 = HORIZONTAL	3 = PENDENT
	Taper:				Drying Time (U	nhusked Ear):		
	1	1 = SLIGHT	2 = AVERAGE	3 = EXTREME		1 = SLOW	2 = AVERAGE	3 = FAST
R	KERNEL (D			- CATTLEWIC			Z AVENAGE	
٠.		Ear Mid-Point):						
	1 2	MM LONG	0 7	MM, WIDE	0 4 _{MM.}	THICK		
	Shape Grade	(% Rounds)		· .				
	3	1 = < 20	2 = 20-40	3 = 40-60	4 = 60	0-80	5 = > 80	

RM GR-470-	28					70001	Page 3 of 3
8. KERNEL	(Dried):						
1	Pericarp Color:	1 = COLORLESS 5 = BROWN 8 = VARIEGATE	2 = RED-WH 6 = LIGHT F D (Describe)		3 = TAN 7	4 = BRONZE Y RED	Ē
1	Aleurone Color:	1 = HOMOZYGOU	JS 2 = SEGF	REGATING (Describe)			
	1 = WHITE 7 = PURPLE		3 = TAN PLE 9 = VAR			5 = BRONZE	6 = RED
3	Endosperm Color:	1 = WHITE	2 = PALE YELLOW	3 = YELLOW	4 = PINK-0	DRANGE 5=1	WHITE CAP.
Endosper	m Type:						
3			TRA SWEET (sh2) H PROTEIN	3 = NORMAL STA	-	4 = HIGH AMYLOSE 3 = OTHER (Specify	
2 5	GM. WEIGHT /100	SEEDS (Unsized S	ample)				
9. COB:	MM. DIAMETER A	AT MID-POINT					
Strength:	1 = WEAK	2 = STRONG	Co	olor: 1 = WHITE 2 3 5 = VARIEGATES		= RED 4 = BRO' OTHER (Specify)	
0. DISEAS	E RESISTANCE (O	= Not Tested, 1 = S	usceptible, 2 = Resistant)				
20	STALK ROT (Dipl		0 STALK ROT (F		0	STALK ROT (Gibb	erella)
0	NORTHERN LEAD	Race 1	O CORN SMUT	AF BLIGHT	0	SMUT BACTERIAL WILT	,
0	BACTERIAL LEA	F BLIGHT	0 MAIZE DWAR	MOSAIC	0	STUNT	
	OTHER (Specify)						
. INSECT	RESISTANCT (O =	Not Tested, 1 = Sus	sceptible, 2 = Resistant):				
0	CORNBORER	0	EARWORM	0 SAF	PBEET L E	0 A	PHID
0	ROOTWORM (Nor	thern) 0	ROOTWORM (Western)			•	
0	ROOTWORM (Sou	thern) 0	OTHER (Specify)				
2. VARIET	IES MOST CLOSEL	Y RESEMBLING T	HAT SUBMITTED FOR	THE CHARACTERS O	SIVEN:		
CHARA	CTER		VARIETY	CHARACTER	₹	VARIET	Y
Maturity			H145Ht	Kernel Type		LH149	
Plant Ty			H149	Quality (Edib	ole)	7771/6	
Ear Type	<u> </u>		H149	Usage		1 LH149	
REFERE		griculture. Yearbo	ok 1937.				

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 – A System for the Classification of Corn Inbred Lines – PhD. Thesis, Ohio State University.

COMMENTS:

$$GDD = \frac{1\text{max} + 1\text{min}}{2} - 50^{\circ}\text{H}$$

Additional Description of the Inbred

Exhibit D

LH202 is taller in plant and ear height than LH149. LH202 measures 227 centimeters in plant height and 98 centimeters in ear height. LH149 measures 194 centimeters in plant height and 83 centimeters in ear height.

JMS 5/29/91 The tassel branch angle of LH202 is more upright (30°-40°), while the tassel branch angle of LH149 is more open (greater than 45°). There are purple streaks on the pericarp of the LH202 kernel.

Leaves are present on the green husk of LH202. These leaves are not very long and are sometimes referred to as "rabbit ears." These leaves are not present of the husk of LH149. This characteristic can be seen in the photograph below.

LH202 flowers slightly earlier than LH145Ht. LH202 combines very well with LH82 and LH93 and exhibits good general combining ability. LH202 contributes high yields, good stalks, slow drydown and average roots in hybrid combinations. LH202 is a very good female.

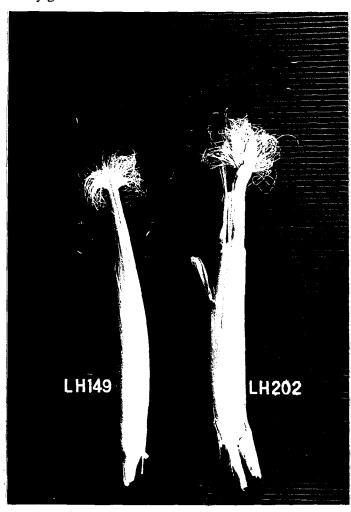
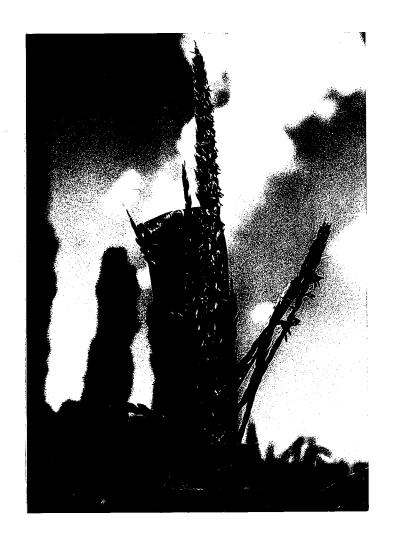
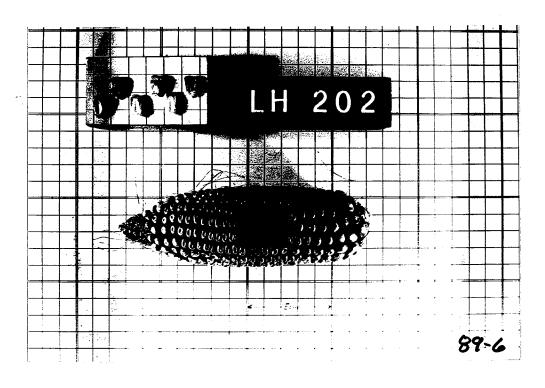


Exhibit D continued





LH202 vs LH149: Plant Height 1989

TOTAL OBSERVATIONS: 180

	LH202	LH149
N OF CASES	180	180
MEAN	225.644	193.844
VARIANCE	227.515	122.590
STANDARD DEV	15.084	11.072

PAIRED SAMPLES T-TEST ON LH202 VS LH149 WITH 180 CASES

MEAN DIFFERENCE = 31.800 SD DIFFERENCE = 18.676 31.800

T = 22.844 DF = 179 PROB = 0.000

LH202 vs. LH149 : Ear Height 1989

TOTAL OBSERVATIONS: 179

	LH202	LH149
N OF CASES	179	179
MEAN	100.201	82.078
VARIANCE	63.611	48.837
STANDARD DEV	7.976	4.988

PAIRED SAMPLES T-TEST ON LH202 VS LH149 WITH 179 CASES

LH202 vs LH149: Tassel Branch Angle 1989

TOTAL OBSERVATIONS: 39

	FH505	LH149
N OF CASES	39	39
MEAN	30.513	53.897
VARIANCE	11.730	15.410
STANDARD DEV	3.425	3.926

PAIRED SAMPLES T-TEST ON LH202 VS LH149 WITH 39 CASES

MEAN DIFFERENCE = -23.385 SD DIFFERENCE = 4.875 T = -29.954 DF = 38 PROB = 0.000

LH202 vs LH149: Plant Height 1990

TOTAL OBSERVATIONS: 33

	LH202	LH149
N OF CASES	33	33
MEAN	204.394	193.303
VARIANCE	73.559	161.718
STANDARD DEV	8.577	12.717

PAIRED SAMPLES T-TEST ON LH202 VS LH149 WITH 33 CASES

LH202 vs LH149: Ear Height 1990

TOTAL OBSERVATIONS: 33

	LH202	LH149
N OF CASES	33	
MEAN	77.030	67.121
VARIANCE	29.718	92.360
STANDARD DEV	5.451	9.610

PAIRED SAMPLES T-TEST ON LH202 VS LH149 WITH 33 CASES

MEAN DIFFERENCE = 9.909 SD DIFFERENCE = 11.251 T = 5.059 DF = 32 PROB = 0.000

LH202 vs LH149: Tassel Branch Angle 1990

TOTAL OBSERVATIONS: 15

	TH505	LH149
N OF CASES	15	15
MEAN	31.000	51.933
VARIANCE	10.429	33.067
STANDARD DEV	3.229	5,750

PAIRED SAMPLES T-TEST ON LH202 VS LH149

MEAN DIFFERENCE = -20.933 SD DIFFERENCE = 6.364 T = -12.740 DF = 14 PROB = 0.000

Exhibit E

STATEMENT OF THE BASIS OF APPLICANT OWNERSHIP

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, is the sole owner and breeder of the LH202 corn inbred line for which it solicits a certificate of protection.